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EXAMINER

LISH, PETER J

ART UNIT PAPER NUMBER

1754

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/913,428

Applicant(s)

PARK ET AL.

Examiner

Peter J Lish

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11/25/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 8-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 8-16 is/are rejected.
- 7) ☒ Claim(s) 17-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

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### **DETAILED ACTION**

Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is indefinite as to how the manganese compound may make up 0% of the preparations. Additionally, the claim recites the limitation "said" in "said preparations". There is insufficient antecedent basis for this limitation in the claim.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 8, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiba et al. (JP 60-096531).

Koshiba teaches a process for the preparation of manganese dioxide for alkali manganese cells. The manganese dioxide is heat treated at a temperature between 100 and 230 °C at a

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pressure below the saturated vapor pressure at the treatment temperature. While the exact pressure is not explicitly taught, the pressure range of the instantly claimed invention is viewed to be below the saturated vapor pressure; it therefore would have been obvious to one of ordinary skill at the time of invention to use a pressure within the instantly claimed range. While the treatment time is not explicitly taught, it would have been obvious to one of ordinary skill at the time of invention to treat the manganese dioxide for a duration within that claimed by the applicant, as the selection of a specific treatment time is viewed to be the optimization of a known process, which could have been determined through routine experimentation, and is held to be obvious by *In re Boesch*, 205 USPQ 215.

Regarding claim 8, it is not explicitly taught that the product manganese dioxide will have no edges, it is expected that this be the case as no difference is seen between the process of Koshiha et al. and that of the instantly claimed invention.

Claims 1, 4, 8, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sako (JP 56-045829).

Sako teaches the manufacture of dehydrated gamma-manganese dioxide having accelerated discharge reaction by treating the compound under conditions of temperature and time enough to allow the water to be lost without practically converting the gamma-manganese dioxide into beta-manganese dioxide. While the temperature of the treatment is not explicitly taught, it is expected that it be between 50 and 200 °C, because the transition to beta-manganese dioxide is known to start at about 200 °C. While the use of pressure is not explicitly taught, it is expected that the pressure of the treatment may fall within the range claimed by applicant, as a pressure of 0.1 dyne/cm<sup>2</sup> is within a normal fluctuation of atmospheric pressure and could thus

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easily occur on a slightly high-pressure day. While the treatment time is not explicitly taught, it would have been obvious to one of ordinary skill at the time of invention to treat the manganese dioxide for a duration within the range claimed by the applicant, as the selection of a specific treatment time is viewed to be the optimization of a known process, which could have been determined through routine experimentation, and is held to be obvious by *In re Boesch*, 205 USPQ 215.

Regarding claim 8, it is not explicitly taught that the product manganese dioxide will have no edges, it is expected that this be the case as no difference is seen between the process of Sako and that of the instantly claimed invention.

Claims 1, 4, 8, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uedaira et al. (US 4,585,718).

Uedaira teaches a process for the preparation of manganese dioxide for use in a lithium-manganese dioxide cell. The process comprises adding nitric acid to manganese dioxide and heating at a temperature from 170°C to 500°C, although the lower temperatures are preferred. While the use of pressure is not explicitly taught, it is expected that the pressure of the treatment may fall within the range claimed by applicant, as a pressure of 0.1 dyne/cm<sup>2</sup> is within a normal fluctuation of atmospheric pressure and could thus easily occur on a slightly high-pressure day. While the treatment time is not explicitly taught, it would have been obvious to one of ordinary skill at the time of invention to treat the manganese dioxide for a duration within the range claimed by the applicant, as the selection of a specific treatment time is viewed to be the optimization of a known process, which could have been determined through routine experimentation, and is held to be obvious by *In re Boesch*, 205 USPQ 215.

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Uedaira also teaches that a previously known process comprises heating the manganese dioxide at a temperature from 150°C to 450°C for removing the water content (and that the gamma phase is known to transform into the beta phase at about 250°C). While the use of pressure is not explicitly taught, it is expected that the pressure of the treatment may fall within the range claimed by applicant, as a pressure of 0.1 dyne/cm<sup>2</sup> is within a normal fluctuation of atmospheric pressure and could thus easily occur on a slightly high-pressure day. While the treatment time is not explicitly taught, it would have been obvious to one of ordinary skill at the time of invention to treat the manganese dioxide for a duration within the range claimed by the applicant, as the selection of a specific treatment time is viewed to be the optimization of a known process, which could have been determined through routine experimentation, and is held to be obvious by *In re Boesch*, 205 USPQ 215.

Regarding claim 8, it is not explicitly taught that the product manganese dioxide will have no edges, it is expected that this be the case as no difference is seen between the process of Uedaira et al. and that of the instantly claimed invention.

Claims 1-2, 4-9, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibashi et al. (JP 61-016473) with Dahn et al. (US 4,959,282) to show a state of fact.

Ishibashi teaches the formation of a positive electrode using manganese dioxide in which lithium is doped by heat treatment under pressure in an aqueous solution of a lithium salt. Dahn et al. additionally states that Ishibashi (JP '473) suggests conducting aqueous lithium hydroxide treatment of manganese dioxide at superatmospheric pressure and at a temperature above 100 °C, typically 180 °C. While the specific pressure or treatment time is not taught, it would have been obvious to one of ordinary skill at the time of invention to treat the manganese dioxide for a

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duration within the range claimed by the applicant, as the selection of a specific pressure and treatment time is viewed to be the optimization of a known process, which could have been determined through routine experimentation, and is held to be obvious by *In re Boesch*, 205 USPQ 215.

Regarding claims 8 and 9, it is not explicitly taught that the product manganese dioxide will have no edges, it is expected that this be the case as no difference is seen between the process of Ishibashi et al. and that of the instantly claimed invention.

Claims 1-9 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ide (JP 62-126556) with Dahn et al. (US 4,959,282) to show a state of fact.

Ide teaches a process of immersing manganese dioxide in an aqueous solution of lithium, drying, and using as a positive electrode material. Dahn et al. additionally states that Ide (JP '556) teaches treatment of particulate manganese dioxide in excess lithium hydroxide solution with stirring at about 60°C, followed by drying and subsequent heat treatment.

While the use of pressure is not explicitly taught, it is expected that the pressure of the treatment may fall within the range claimed by applicant, as a pressure of 0.1 dyne/cm<sup>2</sup> is within a normal fluctuation of atmospheric pressure and could thus easily occur on a slightly high-pressure day. Additionally, it is expected that the stirring of the treatment solution may produce a shear stress within the claimed range.

While the treatment time is not explicitly taught, it would have been obvious to one of ordinary skill at the time of invention to treat the manganese dioxide for a duration within the range claimed by the applicant, as the selection of a specific treatment time is viewed to be the

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optimization of a known process, which could have been determined through routine experimentation, and is held to be obvious by *In re Boesch*, 205 USPQ 215.

Regarding claim 3, while the weight percentage of manganese in the solution is not explicitly taught, it is expected that it may fall within the claimed range, as Ide teaches the use of excess lithium hydroxide solution.

Regarding claims 8 and 9, it is not explicitly taught that the product manganese dioxide will have no edges, it is expected that this be the case as no difference is seen between the process of Uedaira et al. and that of the instantly claimed invention.

Claims 1-9 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahn et al. (US 4,959,282).

Dahn et al. teaches, in example 1, a process comprising mixing manganese dioxide with a solution of lithium hydroxide and stirring under atmospheric pressure and a temperature of about 100 °C. While the use of pressure is not explicitly taught, it is expected that the pressure of the treatment may fall within the range claimed by applicant, as a pressure of 0.1 dyne/cm<sup>2</sup> is within a normal fluctuation of atmospheric pressure and could thus easily occur on a slightly high-pressure day. Additionally, it is expected that the stirring of the treatment solution may produce a shear stress within the claimed range.

While the treatment time is not explicitly taught, it would have been obvious to one of ordinary skill at the time of invention to treat the manganese dioxide for a duration within the range claimed by the applicant, as the selection of a specific treatment time is viewed to be the optimization of a known process, which could have been determined through routine experimentation, and is held to be obvious by *In re Boesch*, 205 USPQ 215.



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Regarding claim 3, while the weight percentage of manganese in the solution is not explicitly taught, it is expected that it may fall within the claimed range, as varying amounts of lithium (and the water necessary to dissolve it) are used.

Regarding claims 8 and 9, it is not explicitly taught that the product manganese dioxide will have no edges, it is expected that this be the case as no difference is seen between the process of Uedaira et al. and that of the instantly claimed invention.

Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugeno et al. (US 6,083,646) taken with Koshiha et al.

Sugeno et al. teaches a method of forming a cathode for a secondary battery, comprising mixing a manganese compound, such as manganese dioxide, with a lithium compound selected from lithium nitrate, lithium hydroxide, etc., and thereafter calcining the mixture at a temperature between 650 and 780 °C for an extended time, such as 12 or 16 hours (see examples 1 and 5).

Koshiha et al. is applied above. It would have been obvious to one of ordinary skill at the time of invention to use the manganese dioxide produced by the treatment of Koshiha et al. in the process of forming an electrode, as taught by Sugeno et al., because Koshiha et al. teaches a manganese dioxide suitable for use in electrode materials having long discharge time and improved properties.

Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugeno et al. (US 6,083,646) taken with Sako.

Sugeno et al. teaches a method of forming a cathode for a secondary battery, comprising mixing a manganese compound, such as manganese dioxide, with a lithium compound selected

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from lithium nitrate, lithium hydroxide, etc., and thereafter calcining the mixture at a temperature between 650 and 780 °C for an extended time, such as 12 or 16 hours (see examples 1 and 5).

Sako is applied above. It would have been obvious to one of ordinary skill at the time of invention to use the manganese dioxide produced by the treatment of Sako in the process of forming an electrode, as taught by Sugeno et al., because Sako teaches a manganese dioxide suitable for use in electrode materials having accelerated discharge reaction and increased activity.

Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugeno et al. (US 6,083,646) taken with Uedaira et al.

Sugeno et al. teaches a method of forming a cathode for a secondary battery, comprising mixing a manganese compound, such as manganese dioxide, with a lithium compound selected from lithium nitrate, lithium hydroxide, etc., and thereafter calcining the mixture at a temperature between 650 and 780 °C for an extended time, such as 12 or 16 hours (see examples 1 and 5).

Uedaira et al. is applied above. It would have been obvious to one of ordinary skill at the time of invention to use the manganese dioxide produced by the treatment of Uedaira et al. in the process of forming an electrode, as taught by Sugeno et al., because Uedaira et al. teaches a manganese dioxide suitable for use in electrode materials having improved properties.

#### ***Allowable Subject Matter***

Claims 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US 2,701,104.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 571-272-1354. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PL



STUART L. HENDRICKSON  
PRIMARY EXAMINER